

# ENVIRONMENTAL LEADERSHIP IN THE NATIONAL PARKS



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# Or- Greening the National Parks with Biodiesel

Biodiesel and biodiesel blends are significantly reducing several National Parks utilization of nonrenewable fuel resources.

Biodiesel also has the potential to make some park operations petroleum free.

Biodiesel is just one of the important tools incorporated into the sustainability programs at the park level.



# Channel Islands National Park

- Consists of five islands and the surrounding mile of ocean, totaling 249,489 acres.
- The Park is one of the least visited in the system with less than 70,000 visitors on the islands per year.
- The isolation of the islands has protected them from development but now challenges park management in providing energy services.



# Man has visited the islands for thousands of years,

although in limited numbers.



# At and around the islands visitors will find marine life ...

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# Plants Endemic to the Islands ...

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# Spectacular Vistas ...



Except When the  
Santa Ana Winds  
Blow...



# And a variety of sustainable practices in use.





## Which Includes...



- 76 Renewable Energy Systems
- Alternative Fueled Vehicles (80% of fleet)
- Energy Conservation
- Water Conservation
- Green Building Practices
- 3 Petroleum Free Islands
- Recycling & Waste Reduction

# Green Energy Achievements @ Channel Islands National Park.



- Over 28,000 gallons of diesel fuel used for generation on the islands has been eliminated or precluded through the utilization of renewable energy systems.
  - Annual Emission Savings =
    - 333 Tons of Carbon Dioxide.
    - 16,000 Pounds of Nitrous-Oxides.
    - 616 Pounds of Total Suspended Particulates (TSP)
    - 1372 Pounds of Hydrocarbons.
    - 800 Pounds of Sulfur Dioxides.
    - 2,300 Pounds of Carbon Monoxide.
    - And don't forget the motor oil use and generation of hazardous waste.

# Even with these accomplishments

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The Park faced a large energy demand

With the islands moving towards energy independence the park staff began focusing on the largest user of fuel in the park.



# Marine Transportation.

- Annually over 70,000 gallons of diesel fuel is used by the parks boat fleet.
- Options were limited due to operational demands.
- An article in a solar journal on the Sunrider hit the spot.
- For over seven years I've had a biodiesel sample sitting on my desk.





# Marine Biodiesel Program

- In 1998 a funding request thorough the "Green Energy Parks" program identified a project to operate one of the parks research vessels on B100 along with fuel for Anacapa and Santa Barbara Islands.
- In August 2000 the park biodiesel program was implemented.
- To date the park has used over 30,000 gallons of biodiesel.



# “Greening the Pacific Ranger”



- Lubricating Oils- Only re-refined oil is utilized on the boat.
- Electrical Generation- Battery storage and a 110/220 volt inverter provide cabin electricity and reduced generator run time by 65%.
- Bulbous Bow- Installation of a "Bulbous Bow" reduced friction and wake resistance on the hull as it travels through the water, allowing the vessel to travel farther while operating at the same engine RPM and fuel consumption. The fuel savings have averaged 18% and has corresponded in reduced exhaust emissions.
- Biodiesel- In August 2000 the Pacific Ranger began operating on B100. To date the boat has used just under 15,000 gallons of biodiesel. One mechanical failure due to a bad fuel line occurred in September 2001 which caused the generator to require repairs. In January 2002 neoprene gaskets in the fuel tank failed.

# **“Greening the Pacific Ranger”**

- **In 2001 the project received several Award Recognition's including-**
- **The White House Closing the Circle Award**
- **The Federal Energy Management Award**



# “Sea Ranger II”

- Launched in October 2001
- Powered by twin Caterpillar 3406 engines specified for neat biodiesel.
- Average biodiesel use @ 800-1,000 gallons per month.



58' Fiberglass



# More to Come



- Vehicle and Equipment Operations on Santa Rosa and Santa Cruz Islands- 5 generators, 23 vehicles (14 GSA) and 16 pieces of equipment.
- The Ocean Ranger, 100' Crew Boat, 3 GM 60 Series, 535 HP Mains, re-engined January 2003
- The Surf Ranger, 74' LCM-8 Landing Craft 4 GM 672s in 6 pack configuration.
- Requiring an additional 35-40,000 gallons of B100 per year.

# BIODIESEL IN THE NATIONAL PARKS

Yellowstone National Park, The University of Idaho and the Montana Department of Environmental Quality first pioneered biodiesel with the “Truck in the Park Program”. The project placed an unaltered diesel pickup truck into service in Yellowstone National Park, fueled the truck with 100 percent rapeseed ethyl ester, and monitored performance and emissions.

The program started in 1995 and has since demonstrated biodiesel use in all weather conditions while covering over 140,000 mile of operation.



# **BIODIESEL IN THE NATIONAL PARKS**



<b>Assateague Island National Seashore</b>	<b>Channel Islands National Park</b>
<b>Everglades National Park</b>	<b>George Washington Memorial Parkway</b>
<b>Glacier National Park</b>	<b>Grand Teton National Park</b>
<b>Harpers Ferry National Historic Park</b>	<b>Hawaii Volcanoes National Park</b>
<b>Mammoth Cave National Park</b>	<b>Manassas National Battlefield Park</b>
<b>Mount Rainier National Park</b>	<b>National Capitol Parks East</b>
<b>Pictured Rocks National Seashore</b>	<b>Redwoods National Park</b>
<b>Rock Creek Park</b>	<b>Scotts Bluff National Monument</b>
<b>Sleeping Bear Dunes National Seashore</b>	<b>Voyageurs National Park</b>
<b>Yellowstone National Park</b>	<b>Yosemite National Park</b>

■ **At the present time over 650 pieces of equipment and vehicles are being operated at the 20 parks listed above- The spread sheet is quite informative. <http://www.nps.gov/renew/NPSBiodiesel.xls>**

# BIODIESEL IN CALIFORNA NATIONAL PARKS

## Channel Islands National Park Ventura and Santa Barbara, California





# BIODIESEL IN CALIFORNIA NATIONAL PARKS

## Redwoods National Park

Del Norte and Humboldt Counties, California

**The parks 20 pieces of construction, mowing and maintenance equipment run on B-80. Once additional fuels or funding become available the park will begin operating road vehicles on biodiesel blends.**



# BIODIESEL IN CALIFORNIA NATIONAL PARKS

## Yosemite National Park

El Portel, California

**At the El Portel maintenance complex only B20 has been pumped since the spring of 2002. At this base of operations over 87 pieces of equipment and vehicles are serviced and fueled. The complex is a sustainable showcase with solar generation on the roof, utilization of green lubricants and major recycling operations have been undertaken. The next step is to bring B20 to the rest of the park.**



# Obstacles to Overcome-



- \$\$\$
- General Service Administration and their B20 ruling.
- Fuel Availability.
- Rangers who require a SUV and Law Enforcement Vehicles.
- Park managers who must drive an SUV. (Jeep Liberty?)
- In park cooperators/ fuel users.
- NOx
- Fuel Availability.
- Cold Flow Jitters

# Obstacles for Industry to Overcome-



- Feedstock Availability.
- Feedstock Oil Competition.
- Local Fuel Production.
- Unequal tax or production supports.
- State Air Quality Concerns.
- Engine Warranty Issues.
- NOx Concerns.
- Fuel Distribution and availability.



# Green Energy Achievements @ Channel Islands National Park.



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  - And don't forget the motor oil use and generation of hazardous waste.

# NOx Problems- NOx Questions



- Potential increase 2-4% yellow grease, 12-14% soy.
- Per 1000 gallons of petroleum fuel burned- 575 lbs NOx released.
- Increase per 1000 gal B100 @ 4% = 23 lbs = 598 lbs.
- Increase per 1000 gal B100 @ 14% = 80 lbs = 655 lbs.
  
- Solar use and Conservation have saved the park from burning 28,000 gallons of petroleum diesel per year. This equates to eliminating 16,100 pounds of NOx. Annually we could displace petroleum NOx and use 1,400,000 gallons of 2% increase yellow grease biodiesel on the NOx savings @ Channel Islands National Park alone.

# NOx Problems- NOx Answers



For your Customers-  
Fuel Conservation and Conversion is the Answer.

For every 1,000 gallons of diesel fuel conserved they can use 50,000 gallons of 2% NOx yellow grease B100 biodiesel or 250,000 gallons of B20 with no increase in overall NOx emissions. In my calculations, with conservation, there is not a NOx issue.

# Biodiesel Problems/Answers



- It is important to promote and develop the production of biodiesel from locally available feedstocks, both grown or recycled..
  - Locally produced biofuels provide employment, political backing and consumer confidence in the fuel. While avoiding transportation cost, embedded energy increases and issues related to the disposal of locally generated waste oils.
- "We don't have local crops for the job, but we can always harvest from the Old Faithful Inn."**

# Benefits from Pioneering



- Prior to the Green Energy Parks Program at Channel Islands National Park, biodiesel was not available in Ventura County.
- With the implementation of the biodiesel program at the park, the demand in the county generated interest in the commercial arena.

“If you build it...

# Benefits from Pioneering

In March of 2002 the Ventura Harbor Marine Fuel facility opened.

On July 9th the first B20 public fuel pump in southern California opened in Santa Barbara.

Later a B20 pump came on line in Ventura.

In Ventura county interest in bioenergy is resulting in plans for local biodiesel production, development of bio tech training at the community college level and the establishment of a bioenergy working group.

...they will come"





**UNDER CONSTRUCTION**

# Keys to Success in Environmental Leadership

**Eternally**



**UNDER  
CONSTRUCTION**

# Having Management Support for Sustainability is Critical for Success.

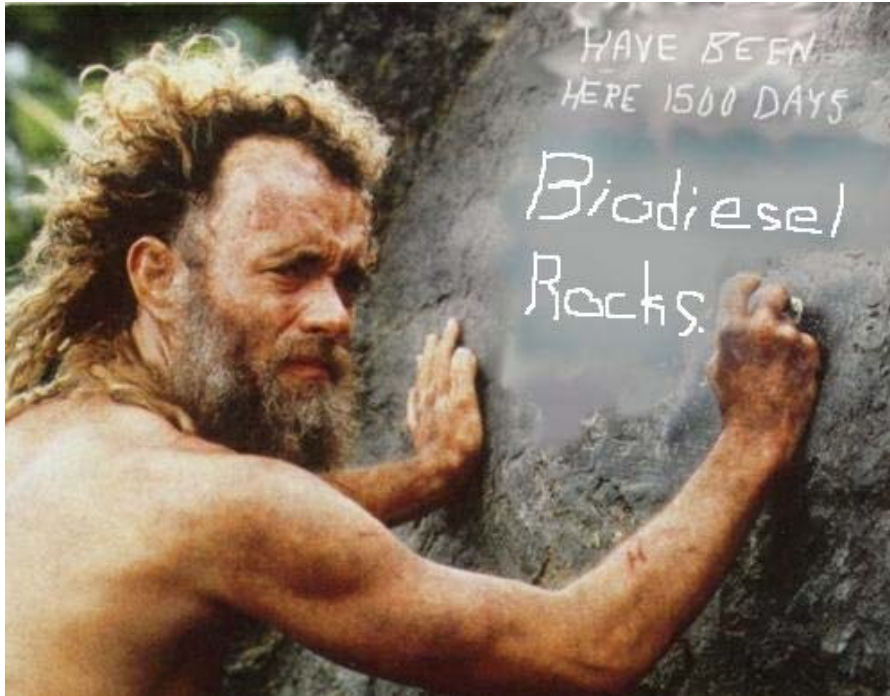


**Gail Norton- Secretary of the Interior**  
**Jim Evanoff- Yellowstone National Park**

**Lynn Scarlet-**  
**Assistant Secretary of the Interior**



# Although a champion can initiate programs.....



As they develop the vision and test the waters.

Than bring others into the fold and enlighten them.



**...while seeking and securing funding which makes partnerships invaluable...**



- Local partnerships benefit your community.
- State Energy Offices are great resources.
- Grant opportunities exist in many venues.
- Be innovative in expanding your horizons.
- Combine operational objectives of environmental leadership, education and resource stewardship for program success.

**.... as all the staff works together  
as a team to make programs function.**



- Operational Staff utilize and benefit from Environmental Leadership.

- Contracting Officers get your materials.





# Don't Let The Negative Folks Get You Down.

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Sometime being a pioneer  
can involve personal risk...  
can make you a target...  
or can be a pain in the...



# SAVE MOTHER EARTH !



Did you participate in your Hotels "Green" Hotel Program?

- Request to Not have your sheets washed each day.
- Hang up your towel and use it the next day.
- Don't use those stupid little shampoo bottles.
- Turn off/down the AC or heat when you leave.
- Don't waste electricity.

More information @ <http://www.greenhotels.com>

# You must lead by example.





# Questions ?

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- National Park Service @ <http://www.nps.gov/chis/homepage>
- Green Parks @ <http://www.nps.gov/renew>
- NPS Biodiesel @ <http://www.nps.gov/renew/npsbiodiesel.htm>
- NPS Biodiesel Spreadsheet @ <http://www.nps.gov/renew/NPSBiodiesel.xls>

